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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,819	07/09/2001	Jean St-Pierre	12221US02	3740
7590	04/02/2004			
Robert W Fieseler McAndrews Held & Malloy 500 West Madison Suite 3400 Chicago, IL 60661			EXAMINER CREPEAU, JONATHAN	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/763,819

Applicant(s)

ST-PIERRE ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 12-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1-34. Claims 12-34 remain withdrawn from consideration as being drawn to a nonelected invention (note remarks below). Claims 1-11 remain rejected for the reasons of record. Accordingly, this action is made final.

It is noted that the modifier “(original)” is present beside claims 1 and 9. However, these claims appear to be amended relative to the previous versions of the claims. The Examiner is considering the previous versions of the claims to be the originally-filed claim sheets that are stamped “AMENDED SHEET”. It appears that in preparing the present response, Applicants may have worked from the originally-filed claims that were published with the international publication. Resolution of this discrepancy is required, as the newly-presented version of claim 1 is of broader scope than the older version of claim 1 relied upon by the Examiner.

### ***Election/Restrictions***

2. The reasons for requiring restriction set forth in the previous Office action were determined to be erroneous because this application was filed under 35 USC §371. The new reasons are as follows:

3. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-11, drawn to a cooling subsystem.

Group II, claim(s) 12-34, drawn to a fuel cell system and method of providing antifreeze and corrosion protection for a fuel cell system.

4. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The independent claims of Groups I and II do not recite common subject matter which makes a contribution over the prior art. The common subject matter, which can be characterized as the subject matter of claim 1, is anticipated by the art of record, such as Shubert et al (U.S. Patent 5,174,902), as set forth below.

5. During a telephone conversation with Michael Harlin on May 30, 2003, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-11. Claims 12-34 remain withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

#### ***Priority***

6. Receipt of a new declaration claiming priority to German application number 19843401.4 is acknowledged. The priority claim is proper and has been entered into the application.

***Claim Rejections - 35 USC § 102***

7. Claims 1-6, 8, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Shubert et al (U.S. Patent 5,174,902). Regarding claim 1, the reference is directed to a cooling subsystem for an engine including a coolant and a circulation loop (see abstract; Figure 23). The circulation loop comprises an ion exchange unit (110; see col. 17, line 10). Regarding claims 1, 2 and 8, after purification, the coolant consists of a mixture of water and ethylene glycol (see col. 17, lines 48-58). Regarding claims 3, 4, and 5, the ion exchange unit comprises an alkaline anion resin and an acidic cation resin (see col. 17, lines 10-15; col. 21, line 54, et seq.). Regarding claim 6, the temperature of the coolant mixture in the circulation loop is 120 °F (49 °C) or lower (see col. 14, line 2). Regarding claim 1, the reference teaches in column 8, line 65, et seq. that a measured coolant conductivity of less than 50 micromhos (50  $\mu$ S) indicates an acceptable purification. This is considered to be anticipatory of the range in claim 1 of “less than about 50  $\mu$ S/cm” since one centimeter of the coolant of the reference would inherently have a conductivity of less than 50  $\mu$ S. This disclosure is also considered to be anticipatory of the range of “less than 5  $\mu$ S/cm” recited in claim 9, because the reference, in disclosing the broader range of less than 50  $\mu$ S, discloses the narrower range of less than 5  $\mu$ S with sufficient specificity. See MPEP §2131.03.

Thus, the instant claims are anticipated.

***Claim Rejections - 35 USC § 103***

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shubert et al. in view of Delport (U.S. Patent 5,681,456).

Shubert et al. is applied to claims 1-6, 8, and 9 for the reasons stated above. However, the reference does not expressly teach that the coolant comprises about 50% water and 50% glycol solvent by volume.

The patent of Delport is directed to a fluid handing system for an automotive engine coolant (see abstract). As disclosed in the abstract, the coolant comprises 50% antifreeze and 50% water.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Delport would motivate the artisan to use a 50/50 water/glycol mixture in the system of Shubert et al. In column 7, line 4, Delport describes a 50/50 ratio as “preferred,” and in column 7, line 21, further describes the ratio as “desired.” Accordingly, the artisan would be sufficiently motivated to use this ratio in the coolant composition of Shubert et al.

9. Claims 1, 2, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-22716 in view of Fredley et al (U.S. Patent 5,565,279).

Regarding claims 1 and 10, JP ‘716 is directed to a water-cooled fuel cell comprising a water circulation loop (see abstract; Figure 1). The fuel cell is a phosphoric acid fuel cell (see paragraph 14 of the machine translation). Regarding claim 1, the circulation loop comprises an

ion exchange unit (6; see paragraph 4). Regarding claims 1 and 9, the reference teaches in paragraph 15 that the coolant conductivity is set to 0.1  $\mu\text{S}/\text{cm}$  after passing through the ion exchange unit.

JP '716 does not expressly teach that the coolant consists of a mixture of water and a glycol solvent, as recited in claims 1 and 2.

Fredley et al. is directed to a coolant system for a phosphoric acid fuel cell (see col. 2, lines 21-25). In column 2, line 20, the reference teaches that the coolant is a water-glycol mixture.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Fredley et al. to use a water-glycol mixture as the coolant of JP '716. In column 2, lines 17-21, Fredley et al. teach that "[t]he cooling system of this invention utilizes a predetermined amount of a preferably water-based coolant, such as water or a water-glycol mixture, which is recirculated thorough an essentially closed loop." Accordingly, as Fredley et al. indicate that such a water-glycol coolant is "preferable," the artisan would thereby be motivated to use this coolant composition in the fuel cell system of JP '716.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-22716 in view of Fredley et al as applied to claims 1, 2, 9, and 10 above, and further in view of Bromberg et al (U.S. Patent 5,409,784).

JP 9-22716 does not expressly teach that its system is used in a vehicle.

In column 6, lines 45-52, Bromberg et al. teach that “[f]uel cells well suited to vehicular activities are the alkaline fuel cell (AFC), the phosphoric acid fuel cell (PAFC), the proton exchange membrane fuel cell (PEMFC), the solid oxide fuel cell (SOFC) and the alkaline fuel cell (AFC), all using hydrogen fuel provided by an external reformer or by a storage tank.”

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Bromberg et al. to use the phosphoric acid fuel cell of JP ‘716 in a vehicle. As noted in the above teaching, these fuel cells are “well-suited” to such an application. Accordingly, the artisan would be motivated to use the phosphoric acid fuel cell of JP ‘716 in a vehicle.

### ***Response to Arguments***

11. Applicant’s arguments filed November 17, 2003 have been fully considered but they are not persuasive. With regard to the Shubert reference, Applicants assert the term “glycol solvent” as defined on page 6 of the instant specification distinguishes claim 1 over the reference because the coolant of Shubert contains inhibitors, which are expressly excluded by the definition in the specification. While the Examiner agrees that the term “glycol solvent” is expressly defined in the specification, it is submitted that claim 1, as currently drafted, still does not distinguish over the Shubert reference. Claim 1 recites, *inter alia*, the limitation that “said coolant comprises a mixture of water and a glycol solvent.” The term “comprises” is open-ended and does not exclude other elements from being present in the coolant mixture. Thus, the coolant of Shubert



is seen as a mixture of water, a glycol solvent (e.g., ethylene glycol) and various inhibitors. Thus, while the explicit definition of “glycol solvent” as excluding inhibitors is acknowledged, it is still seen that the coolant mixture as a whole does not exclude such inhibitors. Therefore, it is submitted that the language of claim 1 is not sufficient to distinguish over Shubert.

Furthermore, Shubert contains the following disclosure at column 17, line 48:

such as line 72. After the engine antifreeze coolant liquid has been purified to a desired level, the engine antifreeze coolant liquid typically comprises an aqueous coolant (i.e., water) and ethylene glycol (if a freezing point depressant was initially employed). Essentially all oils/greases (i.e., hydrocarbons), particulates (e.g. rust particles), cations and anions have been removed, including any and all inhibitors and other additives that were previously contained in the engine antifreeze coolant liquid before passing through the apparatus 10 for purification. These inhibitors and additives, which are

Thus, Shubert teaches that essentially all inhibitors are removed from the coolant during purification, resulting in a coolant comprising only water and ethylene glycol. It is submitted that at this point in time (immediately post-purification), the coolant composition still anticipates the coolant composition of claim 2, even though claim 2 recites a coolant “consisting of” water and a glycol solvent. This is because at this point in time, the coolant of Shubert contains only water and ethylene glycol. The above-noted definition of “glycol solvent” does not include anything relating to the point in time during operation of the coolant subsystem that the coolant must be free of inhibitors, nor should such a limitation be read into the claims. Thus, it is submitted that the coolant mixture of Shubert does consist of water and a glycol solvent at a particular point in time, thus anticipating claims 1 and 2, even though the inhibitors are added back into the system at a later point in time.

Regarding the JP '716 publication, Applicants assert that this publication teaches the use of "deionized" water in the coolant, and therefore addition of ethylene glycol to the water would be unobvious based on the teaching of WO 99/05741 at page 13, line 26. The Examiner acknowledges that the WO '741 publication does appear to teach away from adding ethylene glycol to deionized water (although it does not say exactly *why* one should not do that). However, it is submitted that the water of the JP '716 reference is not in fact "deionized." Neither the Examiner nor the JP '716 reference has made this characterization of the water of the JP '716 reference; the characterization has been made by Applicants. The Examiner submits that a person of ordinary skill in the art, when viewing JP '716, would not see the water of the reference as being "deionized" merely because the system contains an ion-exchange unit. The reference teaches that the water is "pure" after being purified by the device 6 (see abstract), but also teaches that the water normally contains impurities. This disclosure would not lead the artisan to view the water as being "deionized." It is further submitted that the term "deionized" is a specific term that is used by persons of skill in the art to convey the importance of the purity of the water being used. In other words, if the inventors of JP '716 had wanted to convey that their water was "deionized," then they would have used that term. In any event, it is the Examiner's position that the evidence of obviousness of adding ethylene glycol to the system of JP '716 (i.e., the Fredley reference) outweighs the evidence of nonobviousness of such. Accordingly, the rejection is believed to be proper and is maintained herein.

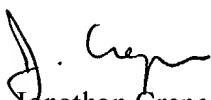
*Conclusion*

12. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

  
Jonathan Crepeau  
Patent Examiner  
Art Unit 1746  
March 30, 2004